

## CLAIMS

What is claimed is:

1. A homogeneous assay for the determination of deoxynivalenol (DON) in  
5 grains, said homogeneous assay comprising the steps of:  
extracting DON from a grain sample to provide an extract;  
combining said extract with a tracer and an antibody to provide a mixture, said  
tracer comprising DON conjugated to a fluorophore, said tracer being able to bind to said  
antibody to produce a detectable change in fluorescence polarization;  
10 measuring the fluorescence polarization of said mixture to obtain a measured  
fluorescence polarization; and  
comparing said measured fluorescence polarization with a characterized  
fluorescence polarization value, said characterized fluorescence polarization value  
corresponding to a known DON concentration.  
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2. The assay of claim 1, wherein said fluorophore is 6-aminofluorescein.
3. The assay of claim 1, further comprising the steps of:  
providing a plurality of DON standard solutions, each of said DON standard  
20 solutions having a different known concentration of DON;  
adding said tracer and said antibody to each one of said plurality of DON standard  
solutions, so as to provide a plurality of standard mixtures; and

measuring the fluorescence polarization of each one of said plurality of said standard mixtures to provide a plurality of standard fluorescence polarization values corresponding to known DON concentrations.

5           4. The assay of claim 3, wherein said characterized fluorescence polarization value is one of said standard fluorescence polarization values.

5. A homogeneous assay for the determination of trichothecenes in grains, said homogeneous assay comprising the steps of:

10           extracting trichothecene from a grain sample to provide an extract;  
              combining said extract with a tracer and an antibody to provide a mixture, said tracer comprising a predetermined trichothecene conjugated to a fluorophore, said tracer being able to bind to said antibody to produce a detectable change in fluorescence polarization;

15           measuring the fluorescence polarization of said mixture to obtain a measured fluorescence polarization; and

              comparing said measured fluorescence polarization with a characterized fluorescence polarization value, said characterized fluorescence polarization value corresponding to a known trichothecene concentration.

20           6. The assay of claim 5, wherein said predetermined trichothecene is deoxynivalenol (DON).

7. The assay of claim 6, wherein said fluorophore is 6-aminofluorescein.

8. The assay of claim 5, further comprising the steps of:

providing a plurality of trichothecene standard solutions, each of said standard

5 trichothecene solutions having a different known concentration of trichothecene;

adding said tracer and said antibody to each one of said plurality of trichothecene  
standard solutions, so as to provide a plurality of standard mixtures; and

measuring the fluorescence polarization of each one of said plurality of said  
standard mixtures to provide a plurality of standard fluorescence polarization values  
10 corresponding to known trichothecene concentrations.

9. The assay of claim 8, wherein said characterized fluorescence polarization  
value is one of said standard fluorescence polarization values.

15 10. An assay kit for the determination of deoxynivalenol (DON) content in  
grains, said assay kit comprising:

an antibody and a tracer, each in an amount suitable for at least one assay, and  
suitable packaging, said tracer comprising DON conjugated to a fluorophore, said tracer  
being able to bind to said antibody to produce a detectable change in fluorescence  
20 polarization.

11. The assay kit of claim 10, wherein said fluorophore is 6-aminofluorescein.